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ABSTRACT

This report describes activities and presents working-group reports and resolutions from a seminar on environmental education conducted June 20 to July 11, 1970 at Foresta Institute, Carson City, Nevada. Attended by representatives from 14 countries, the seminar had the following aims: 1) to bring together specialists responsible for curricula design at primary and high school levels from both developing and developed countries; 2) to discuss curriculum innovation ideas and principles of potential use in environmental conservation education; 3) to allow delegates to participate in local field ecology studies with demonstration teams of students; and 4) to expose the specialists to a broad exchange of experiences and views. The complete agendas of the field studies, lectures, and discussions are represented, along with the reports of the four working groups (each on a separate topic within the area of environmental education); resolutions of the participants; their recommendations to UNESCO and IUCN; and plans for follow-up action. An appendix lists conference participants. (JLB)

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INTERNATIONAL UNION FOR CONSERVATION OF NATURE
AND NATURAL RESOURCES

FINAL REPORT

INTERNATIONAL WORKING MEETING
ON
ENVIRONMENTAL EDUCATION IN THE SCHOOL CURRICULUM

Held as a part of the UNESCO's INTERNATIONAL EDUCATION YEAR in cooperation with UNESCO and FORESTA INSTITUTE at Foresta Institute for Ocean and Mountain Studies, Carson City, Nevada, U.S.A.

I.U.C.N.

September 1970

ED 000 372

THE INTERNATIONAL WORKING MEETING

ON ENVIRONMENTAL EDUCATION IN THE SCHOOL CURRICULUM

Conducted by IUCN in Cooperation with UNESCO
as part of the International Education Year of UNESCO
at Foresta Institute for Ocean and Mountain Studies

20 June - 11 July 1970

Background

The Biosphere Conference, convened by UNESCO in 1968, recommended holding international education programs in environment and environmental education. Such a meeting entitled "Environmental Education in the School Curriculum" has been held at Foresta Institute for Ocean and Mountain Studies in Nevada, U.S.A.

The specific aims of this international working meeting in ecology and environmental studies were: (1) to bring together specialists responsible for curricula-making at primary and high school levels from both developing and developed countries; (2) to discuss curriculum innovation ideas and principles which could be used in environmental conservation education; (3) to allow delegates to participate in local field ecology studies with demonstration teams of students; (4) to expose the specialists to a broad exchange of experiences and views. These experiences hopefully will help the specialists to implement more effectively curriculum concepts in environmental education.

The IUCN education program at Foresta Institute was divided into four parts, (1) Working Sessions (environmental education lectures and discussions), (2) Field Study Methodology Sessions, (3) Field Excursions, and (4) Resolution Development.

The core of the working day was the presentation of a position paper by a participant or guest lecturer. The content might include one of the following: present environmental problems, continuous system of environmental education; implementation of environmental principles in school curricula; environmental-

conservation education in the school curriculum in various countries; preparation of textbooks and teaching aids suitable for the individual nations represented. Immediately following each paper a lengthy discussion ensued. The discussion period was quite important as it allowed a free exchange of ideas, especially in problem areas familiar to delegates.

The remainder of the day (usually ½) was spent on a Field Excursion or most usually in a Field Study Methodology Session. Field Study Methodology was an unusual aspect of the session. A student demonstration group illustrated the use of field and laboratory techniques in ecological studies. The demonstration group composed a sample of students of varying backgrounds and of varying grade levels from diverse geographical areas of the U.S.

The delegates were able to observe and actually participate with the untrained students under various field conditions, thus providing a truly relevant education experience.

On a Field Excursion the participating delegates were able to observe nearby areas with critical environmental problems or visit places where environmental science course work was in progress. Field excursions were made to Pyramid Lake, Lake Tahoe, Washoe Dunes, a Sierran Mountain Meadow, developing Sierra Ski areas, the Desert Research Institute, the University of Nevada and Incline High School.

Midway in the third and final week the conference began to assess its work; draw conclusions. Resolution writing began. New ideas, problems and significant approaches to an environmental curricula developed during the first two weeks-and the early part of the third week, provided the framework for the resolution writing.

Proceedings of the meeting, its conclusions and resolutions will be published shortly.

INTRODUCTION

by
Dr. Samuel F. Dennis
Under Secretary for Instruction
Department of Education, Monrovia
Liberia

United Nations objectives for designating the year 1970 the beginning of the "Second Development Decade," as International Education Year, are essentially for the purpose of evaluating past achievements; analyzing present educational problems and intensifying national efforts in the expansion and improvement of educational programs and systems. Four important suggestions were made by UNESCO as being worthy of study and implementation during this Second Development Decade. Among them is that of making educational systems realistically responsive to individual needs and aspirations, and relevant to the societies in which people live.

In cooperation with the United Nations Educational Scientific and Cultural Organization (UNESCO), the International Union for Conservation of Nature and Natural Resources (IUCN), organized a Working Committee to conduct a Seminar on ecology and environmental instructions, to be conducted at Foresta Institute, Carson City, Nevada, U.S.A. This was a challenge. The task of bringing man to the realization of the fact that he is becoming the victim of his own inventions is one of the most challenging ones of our times. This is not easily presented neither is it readily accepted. As urgent as the need is so is it a threat to the false securities man has found in the technosphere.

The Working Meeting began its work at Foresta Institute on June 20 with representatives from fourteen countries and four continents. Under the leadership of Foresta's President, Dr. R.G. Miller and Dr. J. Cerovsky of IUCN, for twenty days, lectures were given by professional scientists and environmental specialists; seminars conducted; discussions held and field work

designed and supervised with the full participation of delegates. These were intended to emphasize that the survival of this beautiful world is threatened by man's technological invasion into the biosphere; and depends upon his changed and sustained right attitude and activities in a nature conservation program. The effective creation of this awareness and a strong emphasis on environmental education as an interdisciplinary and multidisciplinary science is evidenced by this Report and is its principal thesis.

Foresta Institute could be referred to as the biggest little Institute in the world. Small in area and structure, it is unlimited in its global outreach and impact in relating environmental education to national and international needs and in bringing man in harmony with his total environment.

At Foresta Institute representatives of many nations have been exposed to the realization of the need to check the imbalance which now exists between biosphere and technosphere. The pressing and urgent need for nature conservation, preservation management and utilization was underscored.

This Report contains valid recommendations to IUCN and UNESCO and humble suggestions to member States which we hope would appeal to them for eventual implementation.

Finally this Report summarizes twenty days of intensive training and rigid activities at Foresta and indicates the method of operation and the results achieved in the efforts to fulfil the assignment of IUCN and UNESCO.

The Program

Methodology of Field Studies (usually a.m.)

Working Day 1 -- Deployment to Desert Sand Dune Environmental Study Area, Field Observation of Demonstration Student Group.

Working Day 2 -- Deployment to Slide Mountain study area - Field lecture: "Local environmental conditions" (J.V.A. Conkey, Foresta Institute). Observation of demonstration student group oral examination (reporting on a previous 4-day desert environmental study).

Debriefing on Field Observations.

Participation of delegates with students in reducing data from the morning field work.

Working Day 4 -- Observation of student classroom instructional techniques.

Deploy to field study area to see application of lecture material.

Debriefing on field observations.

Working Day 5 -- Excursion to Desert Research Institute and University of Nevada.

Working Day 6 -- "Teacher training in environmental science" (J.V.A. Conkey, Foresta Institute).

Deploy to field microclimate technique observation.

Working Day 7 -- Demonstration students oral examination on Lewer's Canyon environmental study areas.

Working Day 8 -- Observation of student classroom lecture -- "Ecological evolution of streams and ponds" (J.V.A. Conkey, Foresta Institute).

Deploy to mountain meadow ecological study area.

Debriefing on field observations.

Working Day 9 -- Observation of student activities -- Washoe Swamp ecological area.

Working Day 10 -- Excursion to Pyramid Lake, a critical environmental area.

Working Day 11 -- Excursion to Incline High School and lecture: "Adapting special local facilities to existing curricula" (J.V.A. Conkey, Foresta Institute).

Working Day 12 -- Excursion to Lake Tahoe and proposed Heller community-school area project.

Working Day 13 -- Lecture: "Environmental education in the State of Nevada" (Jack O'Leary, Nevada State Department of Education).

Working Day 14 -- "An elementary school program in environmental education for culturally and environmentally deprived students" (Helen Anderson, Kit Carson Elementary School).

Working Day 15 -- Conclusion Drafting Committees.

Working Day 16 -- Excursion -- Nevada State agencies.

Working Day 17 -- Conclusion and Resolution Drafting Committees.

Working Day 18 -- Conclusion and Resolution Drafting Committees.

Working Sessions
Environmental Education in School Curriculum

Working Day 1 -- Keynote Address (R.G. Miller, Foresta Institute).

Keynote Address IUCN (Jan Cerovsky, IUCN).

Working Day 2 -- Devoted to field observation and later discussion.

Working Day 3 -- Lecture: "The System of Environmental Education" (Jan Cerovsky, IUCN).

Delegate Lecture: "Environmental Education in the Curricula of Indian Schools" (S. Doraiswami, India).

Discussion Session (Chairman, R.G. Miller, U.S.A.)

Lecture: "Educational T.V. (L. Smith, Station KOED Bay Area Educational Television Association, San Francisco).

Working Day 4 -- Delegate Lecture: "Biological education in relation to manpower requirements in Western State of Nigeria" (V. Ninan, Nigeria).

Discussion Session (Chairman, E.S. Mohapi, Lesotho).

Lecture: "Citizen action -- human resources" (Maya Miller, U.S.A.).

Lecture: "International legal aspects of environmental conservation" (Homer G. Angelo, U.S.A.).

Working Day 5 -- Lecture: "Field stations in research and as an educative agency" (M. Dale Arvey, U.S.A.).

Delegate Lecture: "Environmental education in the primary schools -- the Netherlands" (Harry Wals, The Netherlands).

Discussion Session (Chairman, Mathew Baibas, Greece).

Lecture: "Permanent study areas and their protection in different parts of the world" (Maria Buchinger, Argentina).

Delegate Lecture: "Various environmental programs in the Netherlands" (Harry Wals, The Netherlands).

Working Day 6 -- Keynote Address UNESCO (P.C. Bandyopadhyay, UNESCO).

Discussion Session (Chairman, J. Cerovsky).

Delegate Lecture: "1970 Natural Resources and Conservation Education Seminar in Lusaka, Zambia" (J. Mubanga, Zambia).

Lecture: "Swedish Schools and European Conservation Year, 1970" (Johann Flodstrom, Sweden).

Working Day 7 -- Observation of oral reports.

Working Day 8 -- Working Group I: "Concepts of environmental education" (Chairman, P.C. Bandyopadhyay, reporter, M. Buchinger).

Delegate Lecture: "Environmental education and the NEED Program" (William Taylor, National Park Service, U.S.A.).

Round Table: "Extracurricular activities as complementary to formal education", with National Wildlife Federation Representatives joining (W. Reavely, J. Ruch).

Working Day 9 -- Working Group II: "School facilities and staff environmental education" (Chairman, S. Dennis, Liberia, reporters, H. Wals, Netherlands and V. Ninan, Nigeria).

Delegate Lecture: "The introduction of conservation and ecological education in Lesotho" (E.S. Mohapi, Lesotho).

Guest Lecture: "Environmental education school programs in the State of California" (R. Schafer, U.S.A.).

Working Day 10 -- Lecture: "Why Care? Endangered Species in the classroom" (T. Nappe, U.S.A.)

Day devoted to Pyramid Lake Excursion.

Lecture: The work of the Biology Teaching Commission of IUBC" (D.M. Reynolds, U.S.A.)

Working Day 11 -- Working Group III: "School outdoor and community facilities for environmental education" (Chairman, W. Taylor, reporter, E.S. Mohapi).

Delegate Lecture: "Textbooks and teaching aids in environmental education" (R. Saveland, U.S.A.).

Working Day 12 -- Working Group IV: "Starting and improving environmental education curricula" (Chairman, S. Doraiswami, reporters, M. Baibas and H. Wals).

Delegate Lecture:"Increased emphasis on environmental education in Liberia" (The Hon. Dr. Samuel F. Dennis, Liberia).

Lecture: "The Nature Conservancy and long term teaching areas" (H. Johnson, The Nature Conservancy, U.S.A.).

Working Day 13 -- Working Group V: "Summarization of Working Sessions".

I-VI (Chairman, J. Mubanga, reporter, J. Conkey).

Delegate Lecture:"Environmental education in Pakistani schools curricula" (Dr. T.A. Lodhi, West Pakistan).

Working Day 14 -- Resolution and Drafting Committees.

Working Session IV (continued).

Working Day 15 -- Delegate Lecture: "Aspects of the Creek educational system with special reference to environmental education" (M. Baibas, Greece).

Delegate Lecture: "Environmental education in Venezuela"

(R.G. Gondelles, Venezuela).

Lecture: "The arts and environmental education" (N. Raven, U.S.A.)

Resolution and Drafting Committees.

Working Day 16 -- Resolution and Drafting Committees (continued).

Delegate Lecture: "Introduction of environmental education in the curricula of Sudan schools" (A. Zakaria, Sudan).

Delegate Lecture: "Implementation of environmental education in Senegal" (S.L. Gueye, Senegal).

Working Day 17 -- Preparation and finishing of reports and resolutions.

Lecture: "The youth out-of-school activities and education in environmental studies and conservation" (J. Cerovsky, IUCN).

Working Day 18 -- Closing Session: Adopting of resolutions.

Lecture: "Youth environmental action in the U.S.A." (Miss Karen Jensen, U.S.A.)

Lecture: "International bibliographic aids for ecology instruction and library development" (J.B. Regnell, U.S.A.).

The future of environmental education planning and follow-up. Discussion with Members of IUCN Commission on Education (J. Cerovsky, IUCN).

REPORT OF THE WORKING GROUP I
CONCEPTS AND ELEMENTS OF ENVIRONMENTAL EDUCATION

Chairman: Mr. P.C. Bandyopadhyay Reporter: Dr. M. Buchinger

After discussing a variety of possible definitions, the delegates agreed to accept the following:

> Environmental education is the process of recognizing values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the interrelatedness among man, his culture and his biophysical surroundings. Environmental education also entails practice in decision-making and self-formulating of a code of behavior about issues concerning environmental quality.

Some of the delegates felt that the words "interpreting" or "transmitting" of concepts and knowledge should have been included into the definition to stress the different phases of the educational process.

Delegates whose native tongue is not English expressed their concern about possible misunderstandings when translating expressions like "skills" and "self-formulation."

Based on the Concepts and Recommendations of the Education Commission of the UNESCO Conference on Biosphere which were used as a general outline, the delegates aimed to further develop and establish some concrete guidelines.

First of all, the group discussed which of the elements should be included in the curriculum. It was agreed that environmental education is a science-centered multidisciplinary subject where most--if not all school subjects--could and should be incorporated. Wherever possible it might also be taught at different levels as a subject or as units. In teacher-training courses the broad concept of environmental education should form an essential element of this program.

A lengthy discussion followed about the so-called "key subjects" in which the elements of environmental education could be incorporated. The reason for the differences of opinion expressed by the delegates could be traced to the fact that the school curricula in different countries have a variety of subject-matters, and sometimes even under the same name, e.g. "Natural Sciences," there are different matter content. It was decided that a special drafting committee will elaborate on this problem. Tentatively, it was agreed that wherever it is taught, the following subject matter areas should be used: ecology, conservation, geography, geology, pedalogy, hydrology, agriculture, botany, zoology, physics, chemistry, climatology, etc.

It was suggested that certain elements of mathematical reasoning (logic) would prove useful in the process of decision-making.

REPORT OF THE WORKING GROUP II
SCHOOL FACILITIES, STAFF, SPACE, FIXTURES,
INSTRUMENTS AND EQUIPMENT

Chairman: Dr. S.F. Dennis

Reporters: Mr. V. Ninan
Mr H. Wals

Under the planning three aspects of the topic were discussed:

1. Aims and objectives.
2. Present existing problems in many countries and the causative factors.
3. Solution to those problems.

There was unanimity of opinion on a multi-disciplinary approach to the teaching of environmental education. School facilities, staff training, equipment, instruments, fixtures and school spacing must be on the basis of the aims and objectives.

Various problems facing the developed and developing countries were brought out. Problems such as lack of funds, lack of trained teachers, failure in catching the imagination of the policy-makers are common.

As the teacher is the key person, the success of effective handling of environmental education depends mainly on him. The teacher training colleges should emphasize environmental education in their pre-service programs.

For in-service training assistance could be sought from governmental and non-governmental organizations concerned with environmental work. In pre-service and in-service training programs for teachers, field studies and ecology are to be emphasized. Through in-service training, the otherwise unqualified teachers could be brought in line with the trained teachers.

Such aspects as space, instruments, equipment and fixtures are to be based on the individual countries financial resources and

environmental problems even though it may be useful to draw out a basic minimum requirement for an effective handling of environmental education. This may also be helpful when new schools are started.

It would be better that a ratio of classroom has not more than 30 students to a teacher in view of the fact that more personal attention and contact from a teacher is required for experimentation and field work.

A continuous program on ecological research was considered necessary. Such programs should be associated with documentation programs on environmental education. The possibility of specialists helping the various centers on an international, inter-regional and national basis was considered.

In addition, creative arts like drawing, painting and sculpture would develop the power of observation and presentation. For the purpose of encouraging better and correct exposition, language and literature courses have a contribution to make to the general understanding of the subject-matter of environmental education.

Delegates felt that Mathematics and literary subjects and creative arts should be used not only as auxiliary but as component disciplines of environmental education.

The role of Social Sciences, History, Economics, Civic Education as important factors was unanimously recognized.

It was suggested that surveys should be made to find out if teaching material on environmental education is available or if new material has to be produced. There should be also a definite differentiation between the teaching material for the use of teachers and that for the use of students.

REPORT OF THE WORKING GROUP III

SCHOOL OUTDOOR AND COMMUNITY FACILITIES

Chairman: Mr. W. Taylor Reporter: Mr. E.S. Mohapi

I. Purpose

a) To focus the ideas or concepts of environmental education introduced in the classes and,
b) To allow these to be clarified by the student and teacher in actual situations.

II. Scope

Sites selected for outdoor study to be as extensive as the course objectives demand and circumstances allow. These sites may be:

1) School yard/playground. Learning stations. School gardens. Landscaping for environmental education. Miniature ecosystems (i.e. ponds, compost heaps, etc.).
2) Off-site:
   a) Environmental Study Area must reflect the impact, interaction, or interrelationship of man with nature.
   b) Outdoor laboratory area specifically suited to long-term study and student projects or individual and group projects.

Both categories may include natural areas or areas recovering from adverse use (e.g. fields, abandoned lots and properties, junk yeards, dumps and garbage pits, farms and farmlands, banks of rivers and streams, graveyards, historic sites and battlefields, factory sites), and public parks with or without community facilities, e.g. centers of information, etc.

III. Staffing

1. Teacher preparation:
   a) Pre-service - colleges
   b) In-service-Workshops, extension services, camps, etc.

2. Advisors
   a) Agencies and Ministries:
      National
      Regional
      International -- in
         Education,
         Health,
         Agriculture,
         Forestry,
         Tourism,
         Planning,
         Works, etc.
      e.g. IUCN, UNESCO, WHO, FAO.
   b) Industry and Business
      -- may be involved in the development and use of site on a short or long-term basis.

Equipment-- as required by the subjects contributing to the environmental education.

Special projects in the field may not require any site, or may be in response to a critical need for attention. A "town" is an environment in the broadest sense; and adverse use of the land will always provide new situations for investigation.

Study Area

On the primary grade level, the principal goal is appreciation and awareness, the middle stage concentrating

on conservation and use, the secondary stage in developing an environmental ethic--the purposeful courses of action and involvement. These levels of development will dictate the application and choice of sites, off-school opportunities for study.

And international directory of representative environmental education programs should be the ongoing objective of this segment of the proposed IUCN committee.

The directory should include an abstract of each program, simple exercises, and an address or source where additional information may be obtained. For example--Children's Gardens of the Netherlands; NEED/ESA program, National Park Service, USA; programs of special studies--Foresta Institute, etc.

In addition, the directory should compile all testing materials used to evaluate such programs.

The purpose of this directory will be to promote exchange of all environmental materials which may be implemented in or complimentary to programs of other nations.

REPORT OF THE WORKING GROUP IV

STARTING AND IMPROVING ENVIRONMENTAL CURRICULA

Chairman: Dr. S. Doraiswami Reporters: Prof. R. Saveland
Mr. M. Baibas

A. Purpose

To formulate objectives in environmental education for the total curriculum.

B. Scope

For purposes of organization the curriculum was divided into three stages:

Stage I	Primary	approximately ages 5 - 10
Stage II	Middle	approximately ages 11 - 14
Stage III	Secondary	approximately ages 14 - 17

The committee recognized that this organization will not exactly conform to current practices in many localities, but adaptations can readily be made. This particular plan reflects emerging interest in the middle school, and takes into account the research in educational psychology by Piaget, Bruner, Gagne and others.

The pre-primary stage was recognized as especially important in the educational pattern. The discussion revealed that this stage is not in existing in many localities. In view of this and the fact that time was limited, this stage was omitted from the deliberations.

At each stage, it is significant to keep in mind the sequential development of concepts, whereby understandings of one stage are built upon previous experiences. In addition to the vertical integration of the curriculum, it is important to plan horizontal integration in order to

achieve a multi-disciplinary approach.

C. Major Focus of Each Stage

Recognizing the developmental process in learning, a major focus was selected for each stage reflecting the overall objectives of the program at the three levels as follows:

Stage I --
Building basic vocabularies and skills leading to an appreciation and awareness of the varieties and similarities in the environment.

Stage II --
Emerging patterns and interrelationships of environmental features on local, national and world scales, concentrating on conservation and use. During this stage, particular attention is to be given to case studies illustrating representative man-environment problems.

Stage III --
Increasing perception of changes through time with particular reference to in-depth studies of environmental and social problems; in short, developing an environmental ethic.

D. Content

In order to give an indication of the content and objectives of an environmentally-oriented curriculum, a chart was prepared. It was agreed that while serving somewhat as a model for an interdisciplinary, developmental program in environmental education, the chart could be adapted to different national and local situations in a variety of ways.

The horizontal component of the chart is the three curricular stages indicated previously. The vertical component consists

of the various major factors of the natural and cultural environment, rather than traditional subject headings.

The statements given under the headings at each level not only give an indication of content to be interwoven into instruction, but also suggests specific aims and objectives in furthering environmental education throughout the curriculum. The statements constitute performance objectives to be attained by students who have completed a stage in environmental education.

The chart as currently formulated reflects the limitations of time available at this international working meeting. It is recommended that further development and refinement of this work be an ongoing activity resulting from this meeting.

	AREA & LOCATION	ATMOSPHERE & COSMOS	LANDFORMS, SOILS & MINERALS
STAGE I	Experiences basic orientation within the local and National environments. Perceives the earth as the home of man. Observes how man uses and influences the environment.	Can describe and measure climatic factors in the local environment. Recognizes the role of the atmosphere in the life of plants and animals. (special storms, evaporation and precipitation and fire).	Knows that soil is dynamic: (a) it forms (b) it contains living things and supports plant growth (c) it erodes Can identify different kinds of landforms. Sees the interaction between landforms and living things.
STAGE II	Perceives the earth of great magnitude but shrinking in terms of time, distance, and limits of resources. Knows the continuous interaction of man and biosphere.	Can identify and explain the major climate patterns of the world and relate these to vegetative patterns of the earth and economic activities of man. Observes the man-induced climate variations in a local area, noting air pollution and its effects.	Can point out on a map the general arrangement of landforms in his country and the world. Can identify various mineral and energy resources and demonstrate the uneven distribution.
STAGE III	Supports planning and research on wise land use and landscape management while opposing indiscriminate encroachment on open space.	Analyses and contributes to decisions affecting the quality of the atmosphere	Knows how man accelerates processes of degradation and takes steps to ameliorate these conditions: (strip mining), earth moving and sedimentation.

	PLANTS & ANIMALS (BIOTA)	WATER	PEOPLE
STAGE I	Knows from firsthand experiences various kinds of plants and animals in their own environment. Recognizes interdependence among soil, atmosphere, plants (producers) animals and man (consumers)	Knows the necessity of water for life and its importance as a natural resource.	Recognizes the varieties and similarities among people. Knows how people live in and use different environments. Learns the interrelationships between beliefs and rituals and environment.
STAGE II	Can identify and explain a biological community in relation with its environment. Has a notion of the food chain and ecological balance. Recognizes the main types of biological communities and the impact of man on them. Is aware of endangered species, their importance and measures for their conservation.	Knows the water cycle and the various stages in the evolution of streams. Is familiar with the distribution of water on the earth and the general circulation pattern of ocean currents. Has an idea of the influences of water in the distribution of biological communities and how the distribution can be disturbed by pollution.	Sees population movements and settlement patterns as means by which cultural groups choose their environments. Discovers how people have used the same land in different ways at different times.
STAGE III	Acts to create and preserve conditions under which ecologically balanced ecosystems can evolve.	Analyses and contributes to the decisions affecting the availability and quality of water.	Uses data to interpret trends in population growth and distribution in relation to quality of life.

	SOCIAL ORGANIZATION	ECONOMICS	AESTHETICS, ETHICS, LANGUAGE
STAGE I	Recognizes ways in which people organize themselves. Learns individual and group responsibility concerning environment.	Relates food, clothing and shelter needs to available resources. Finds that specialization of labor increases efficiency.	Builds a basic vocabulary of environmental terms. Names and classifies plants, animals, water features, soils, minerals. Acquires basic skills in using visual arts and music to express feeling for the environment in an elementary way.
STAGE II	Observes the relationships between political and natural boundaries. Sees the state as an agency for working on environmental problems. Recognizes international cooperation as a means of solving environmental problems.	Observes patterns in organizing resources with an emphasis on their rational use. (Agriculture and grazing, forestry and fishing, mining and manufacturing, transportation and communication)	Uses visual art, music and dance drama, language and photography to describe and interpret various environments. Appreciates how great artists and writers have perceived their environments.
STAGE III	Acts to alleviate environmental problems through laws, public policy, and action programs	Works toward domestic and international solutions of environmental problems related to nutrition, poverty, transportation, waste disposal, source and distrib- of energy resources.	Has personal attitudes and habits reflecting a caretaker responsibility toward environment and communicates this feeling to others. Visual pollution.

RESOLUTION

WHEREAS, UNESCO endorsed a Seminar in Ecology and Environmental sciences as one of the outstanding activities to be conducted during INTERNATIONAL EDUCATION YEAR; and

WHEREAS, the Working Meeting organized by the International Union for Conservation of Nature and Natural Resources (IUCN) in co-operation with UNESCO (United Nations Educational Scientific and Cultural Organization) did convene at Foresta Institute from June 20, to July 10, 1970;

RESOLVED, that the participants

1. EVALUATE: this Working Session as being a very productive, resourceful, informative and rewarding experience in environmental education, and think it should be most effective in promoting environmental studies in the school curricula;

2. DETERMINE to exert every effort in conveying to their Governments and educational authorities the most recent concepts of environmental education and to promote the implementation of those objectives.

3. DECIDE to suggest and encourage regional and international cooperation in the teaching of environmental education and nature conservation.

4. REQUEST IUCN and UNESCO's acceptance of the listed draft recommendations of the Report of the Working Committee, and respectfully crave the attention of their Governments to the suggestions contained in the Committee's final report;

5. REMAIN available as consultants and promise full cooperation in the execution of the suggested "plan of action" or its revision or redraft.

6. RECORD their unbouded appreciation to UNESCO, IUCN, Foresta Institute and their respective Governments for the oportunity to have been involved in an intensive Working Program on the ecological and environmental sciences and their place in the primary and secondary schools curricula.

7. MAKE honorable mention of an express special gratitude to Foresta Institute's President, staff and workers for the use

of their grounds, facilities and other aids, and for the co-operation shown and services given in making the Working Session a remarkable success.

RESOLVED FURTHER that these resolutions be forwarded to IUCN, UNESCO and member states either as a preambular part of the Final Report of this Working Committee, or as an important appendix thereof.

RESOLVED ALSO, that a copy of these resolutions be filed in the archives of Foresta Institute.

RECOMMENDATIONS AND SUGGESTIONS

Recommendations

Rec. No. 1

The Working Meeting,

Being aware of the importance of using clear and generally acceptable terms,

Recommends to UNESCO, IUCN and possibly other international organizations the following definition of environmental education:

> "Environmental education is the process of recognizing values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the interrelatedness among man, his culture and his biophysical surroundings. Environmental education also entails practice in decision-making and self-formulation of a code of behavior about issues concerning environmental quality".

Rec. No. 2

The Working Meeting,

Considering that an urgent need exists for environmental education in the school curriculum,

Recognizing the special importance of an international co-operation,

Recommends to UNESCO

1) that the member states and their relevant national authorities and organizations be requested and assisted in introducing environmental education in the recent process of curricula innovation;
2) that appropriate environmental education projects be included in and duly executed within the international "Man and Biosphere" program;
3) that conferences, meetings and courses aiming at

stimulation and development of environmental education on national, regional and international level be supported and organized; and relevant materials, information, advice and expert assistance be provided.

Rec. No. 3

The Working Meeting,
Recognizing with satisfaction the attention ascribed to environmental conservation teaching among the basic objectives of the IUCN Commission on Education and relevant projects listed in this commission's program of work,
Expressing its full support to these objectives and program.
Recommends to IUCN, namely its Commission on Education:

1) the organization of regional working meetings on environmental education in the school curriculum in various regions of the world using the experience gained and materials provided by this first introductional Working Meeting as well as the advice and assistance of experts attending this Working Meeting;
2) the organization of a second International Working Meeting in two to three years to evaluate the results achieved in the meantime and to develop further the efforts started;
3) the stimulation of national environmental curricular developments and related activities, such as conferences, workshops or seminars, summer programs, courses, by suggestions to the governments and through the IUCN member organizations.

Rec. No. 4

The Working Meeting,
Considering that an urgent need exists for teacher training and guidance in environmental education,
Recognizing the importance of exchange of experiences and views on an international level,
Recommends to UNESCO and IUCN, particularly its Commission on Education through their joint efforts;

1) the preparation and publishing of a general methods handbook on environmental conservation teaching;
2) the organization of international short-term training courses for teachers, school biologists and other educators involved with or related with environmental teaching, possibly jointly with some universities and teachers training colleges ready to cooperate;
3) the posting of experts to assist the training of teachers in environmental sciences and education in developing countries.

Suggestions

Sugg. No. 1

The Working Meeting,
Considering the appropriate education being a necessary prerequisite for improvement of the total critical environmental situation,
Being aware of the urgent need for environmental teaching and adequate training of teaching personnel,
Suggests to the Governments and their responsible educational authorities as well as to the national educational organizations:

1) that through a reform of the total curriculum, the environmental education be introduced as an obligatory and integrated component of the school educational system at all levels;
2) that appropriate pre- and in-service teachers training be organized through obligatory environmental conservation courses in teacher training colleges, universities and other educational establishments involved in teachers training and through extension programs for students and teachers, such as seminars, workshops and summer camps;
3) that national surveys of the existing textbooks and other materials and teaching aids actually or potentially used in environmental education be undertaken and, if necessary, assistance by relevant international agencies and international organizations be asked in accomplishing this task;

4) that national councils, committees, departments, divisions or similar bodies be established within the ministries of education with the task of development and implementation of environmental principles in school education;
5) that special teachers societies association or similar organizations for environmental education be created in order to improve steadily the situation in environmental teaching and to meet the increasing needs;
6) that national environmental legislation be used to include obligatory environmental education at all levels.

Sugg. No. 2

The Working Meeting,
Considering the urgent need for both students and teachers to be in immediate contact with the living natural environment as a necessary basis for an effective environmental education,
Being aware of existing difficulties in making the necessary facilities available, especially in metropolitan areas,
Suggests to Governments, their educational authorities, national educational and conservation organizations, municipal boards and other relevant bodies:
1) that appropriate educational nature reserves and natural study areas be made available for use by students and teachers in the process of environmental education;
2) that all schools be provided by their own school gardens and landscape gardens;
3) that all schools be supplied with living teaching materials in cooperation with city park services, forestry services, botanical gardens, nurseries, zoos, etc.
4) that educational establishments be encouraged or set up to serve the purpose mentioned above.

Sugg. No. 3

The Working Meeting,
Recognizing the pressing need for promotion and coordination of environmental education on an international level,

Suggests to the United Nations, their specialized agencies and other cooperating international organizations relevant to the subjects:

1) the inclusion of environmental education as one of the basic topics on the agenda of the UN Conference on Human Environment in 1972;
2) the establishment of a permanent inter-agency working group on environmental education as recommended by the Biosphere Conference of UNESCO in 1968.

PLAN OF ACTION

Action Program for follow up Work

I. National

It is suggested that each participant on return arranges a meeting to discuss an action program of follow-up work of this meeting. Representatives of the following sections may be invited to participate:

1) teachers of schools (Primary, Middle, Secondary and Teacher Training);
2) university teachers;
3) Ministry/Department of Education;
4) Ministry/Department of Forestry, Fishery and Agriculture, Natural Resources, etc.;
5) teachers' organizations or/and any other society with interest in environmental education.

It is better to have small committees to begin with leaving room for other to be coopted later on.

The convenor of the meeting may inform the members of the deliberations of this meeting, resolutions and recommendations, and give guidelines for the committee on future plan of action. The IUCN and participants of this meeting may be kept informed of the proceedings.

On receipt of response on such a preliminary meeting, the IUCN may contact the Government, professional organizations, UN agencies and any other bodies in the concerned countries for supporting the follow-up programs.

Names and addresses of such bodies would be supplied by the committee.

Some of the items of action suggested for the committee would be the possibility of

1) organizing in-service training courses and seminars for teachers,

2) setting up environmental education libraries,
3) assessing existing materials and initiating materials which develop some or all of the themes presented by this meeting.

II. Regional

Proper coordination machinery for regional cooperation in environmental education is to be set up with full use of the existing and developing IUCN Education Commission's regional structure.

In view of the number of countries participating in this meeting it is desirable that each participant play a major role in disseminating the spirit of awareness for environmental education on a global level. The following plan of action is suggested:

1) Countries may be grouped in such a way that each participant could organize a common program for an area.
2) The program could include exchange of experience on matters of environmental problems and education.
3) Exchange of materials and visit.
4) Possibility of organizing area or regional meetings.
5) Such regional/area programs should be based on the outcomes from the present Working Meeting and should try to develop its conclusions and thoughts in proper depth adapted to the conditions and needs of the relevant region or area under a central coordination executed by IUCN Commission on Education.

III. Methods Handbook on Environmental Conservation Teaching

The Working Meeting supports the project within the program of the IUCN Commission on Education to prepare and publish a general method handbook on environmental conservation teaching. The conclusions of the Working Session III and the Working Session IV of the present

APPENDIX

LIST OF PARTICIPANTS

A. ORGANIZING COMMITTEE

Chairman:

Prof. Dr. Richard Gordon Miller
Director
Foresta Institute for Ocean and
Mountain Studies
Route 1, Box 620
Carson City, Nevada 89701
U.S.A.

Secretary-General:

Dr. Jan Cerovsky
Education Executive Officer
International Union for Conservation
of Nature and Natural Resources
1110 Morges
Switzerland

Special Consultant:

Mr. P.C. Bandyopadhyay
Specialist on Science Education Program
within the School Curriculum
Division of Curriculum and Research, E.D.S.
UNESCO
75 - Paris 7e
France

Members:

Mr. James V.A. Conkey
Deputy Director
Foresta Institute for Ocean
and Mountain Studies
Route 1, Box 620
Carson City, Nevada 89701
U.S.A.

Working Meeting are proposed as a basis for this manual. The participants of this Working Meeting declare themselves ready to cooperate with the working group of IUCN Commission on Education proposed to deal with this special project.

Dr. Maria Buchinger
Director
Foresta Institute Latin American
Natural Area Programs
National Parks Association Building
1701 18th Street, N.W.
Washington, D.C. 20008
U.S.A.

Mrs. Terry Loy
Acting Secretary
Foresta Institute for Ocean
and Mountain Studies
Route 1, Box 620
Carson City, Nevada 89701
U.S.A.

Secretary: Mrs. Yvonne Booth
Foresta Institute for Ocean
and Mountain Studies
Route 1, Box 620
Carson City, Nevada 89701
U.S.A.

B. DELEGATES

Prof. M. Dale Arvey
Chairman, Department of
Biological Sciences
University of the Pacific
Stockton, California
U.S.A.

Mr. Mathew Baibas
Department of Programming and
Studies of Secondary Education
Ministry of Education
Mitropoleos 12
Athens
Greece

Dr. Samuel F. Dennis
Undersecretary of Education for
Instruction
Monrovia
Liberia

Dr. S. Doraiswami
Head, Biology Department
Department of Science Education
N.C.E.R.T.
Aurobindo Marg
New Delhi - 16
India

Ing. Ricardo Gondelles Amengual
Consejo de Bienestar
Apartado 61407
Caracas
Venezuela

Prof. Sidy Lamine Gueye
Ecole Normale Superieure
Bd. Bourguiba
Dakar-Fann
Senegal

Dr. Tanweer Ahmad Khan Lodhi
Head, Department of Agricultural Education
West Pakistan Agricultural University
Lyallpur,
West Pakistan

Mr. E. Selai Mohapi
Science Education Officer
Ministry of Education
P.O. Box 47
Maseru
Lesotho

Mr. Jones B. Mubanga
Deputy Director Wildlife,
Fisheries & National Parks
Ministry of Lands and Natural
Resources
Lusaka
Zambia

Mr. V. Ninan
Senior Education Officer
Ministry of Education of
Western State of Nigeria
P.M.B. 5030
Ibadan
Nigeria

Prof. Robert N. Saveland
The University of Georgia
127 Fain Hall
Athens, Georgia 30601
U.S.A.

Mr. William M. Taylor
Environmental Education Specialist
U.S. National Park Service
Western Region
450 Golden Gate Avenue
San Francisco, California 94102
U.S.A.

Mr. Yozo Tshukamoto
2-2-9 Asakusabashi
Taito-Ku
Tokyo
Japan
(Present address:
1469 Univ. Terr. 1300
Ann Arbor, Michigan 48104)

Mr. Harry Wals
Head of Teaching Department
School and Children Gardens
Brederode 34
Leiderdorp
The Netherlands

Mr. Abdall Zakaria
Head of Geography Department
Higher Teachers' Training Institute
Omdurman
Sudan

C. VISITING SPEAKERS

Mrs. Helen Anderson, Principal
Kit Carson School
Las Vegas, Nevada
U.S.A.

Prof. Homer Angelo
School of Law
University of California
Davis, California
U.S.A.

Mr. Huey Johnson, Director
The Nature Conservancy
Western Regional Office
San Francisco, California
U.S.A.

Mr. Jack O'Leary
Nevada State Department
of Education
Environmental Education Specialist
Carson City, Nevada
U.S.A.

Mr. Steve Chaplin	Director, Student Studies
Mr. Richard Brown	Assistant Director, Student Studies
Miss Jan Frazier	Field Counselor
Miss Jean Taylor	Assistant Field Counselor
Mr. Tim Kittel	Assistant Field Counselor
Miss Karen Jensen	Research Associate, Ecology

Mrs. Nancy Raven
Escondido High School
Escondido, California
U.S.A.

Prof. Donald M. Reynolds
Member, Commission for Higher
Education in Biology of IUBS
Department of Bacteriology
University of California
Davis, California
U.S.A.

Mr. Rudy Shaffer
Head, Environmental Education Department
Head State of California
Department of Education
Sacramento, California
U.S.A.

Mr. L. Smith
KOED Educational TV
San Francisco, California
U.S.A.

D. FORESTA STAFF

Dr. R.G. Miller	Director
Mr. J.V.A. Conkey	Educational Director
Mrs. Tina Nappe	Research Associate, Endangered Species
Mrs. Terry Loy	Executive Secretary
Mrs. Jean Whitehead	Librarian
Mrs. Yvonne Booth	Secretary
Mr. John Regnell	Research Associate and Director of Library Services and Information